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ABSTRACT

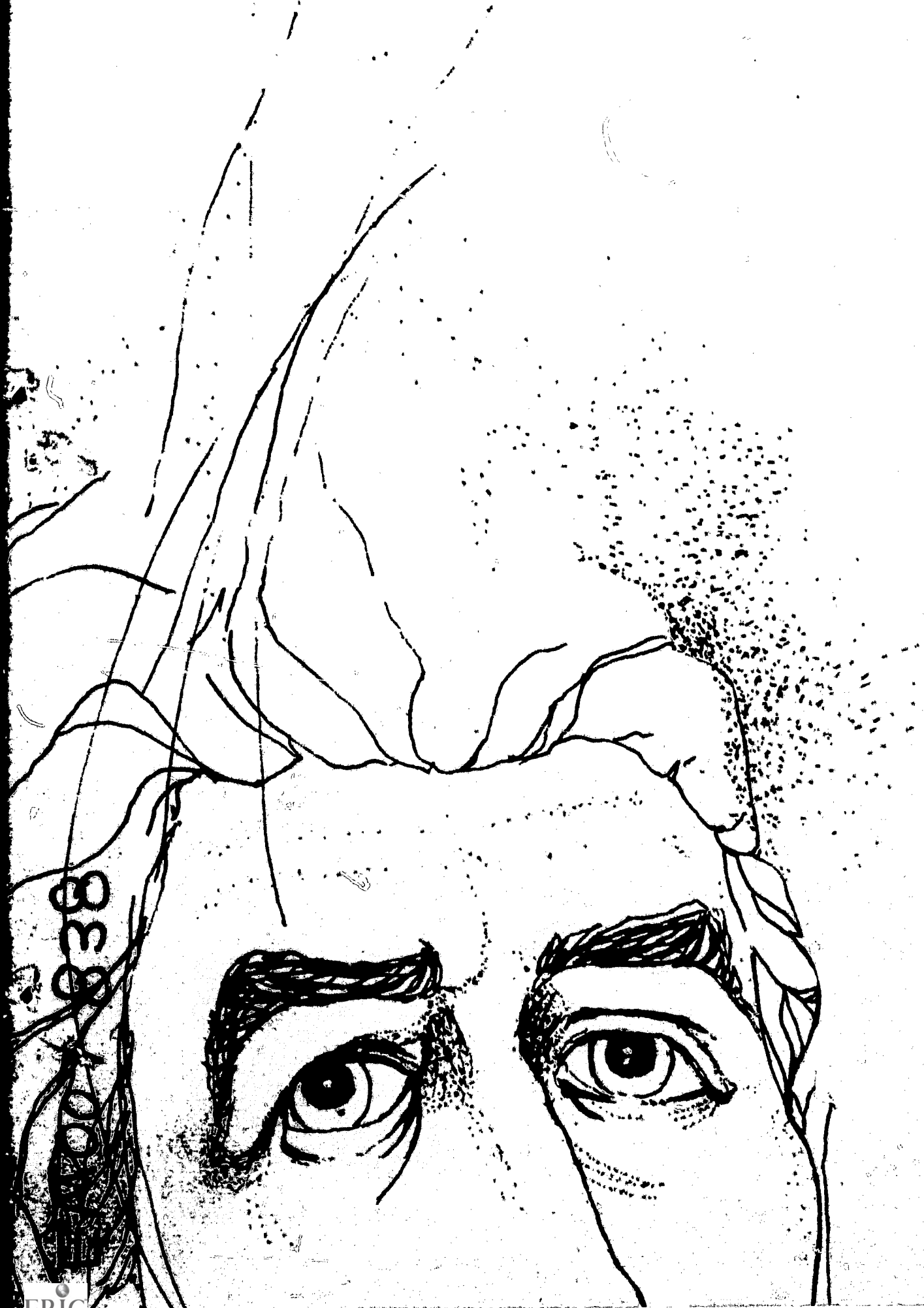
Continuation education is aimed at the student who has not had successful experiences in the comprehensive high school but is subject to compulsory school attendance. This handbook views the instruction process as an interaction between the teacher, the student, and the curriculum. It provides guidance in developing an instructional package designed to allow the student to take responsibility for his own education. The techniques discussed include establishing a concept to be learned, providing motivation, writing the concept in terms of learning objectives, developing learning activities, testing, and enrichment. A sample package on the slide rule is used to illustrate the principles discussed. A reading ease scale is provided, and a bibliography is appended. (JY)

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INDIVIDUALIZED INSTRUCTION IN CONTINUATION EDUCATION



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ED037081

a handbook for

**developing
individualized
instruction
in
continuation
education**

ESEA Title V

COUNTY OF FRESNO, Ernest A. Poore, Superintendent of Schools

FOREWORD

All high schools in the State of California have established programs of Continuation Education or alternates since 1965. These programs are designed to meet the needs of students who have not had successful experiences in the comprehensive high school, but are subject to compulsory school attendance.

The first four years of Continuation Education program development demanded that basic philosophy and administrative practices be initiated through innovated and exemplary projects. An example of a previous Continuation Education project is Operation Reach, an ESEA Title III project funded through the offices of Imperial and Riverside Counties Superintendents of Schools SPIER offices, and implemented by the Riverside Unified School District. One of the end products of Operation Reach is the handbook "Orientation to Continuation Education" which perfected basic philosophical guidelines and described instructional techniques found to be successful.

As programs matured it was obvious that the next great need was assistance for the educator and individualized instruction. With this objective in mind, the State Department of Education, through the office of the Fresno County Superintendent of Schools, funded the ESEA Title V workshop which designed this handbook.

Hopefully, this publication will be the first of a series of extremely valuable materials brought about by exemplary workshops dealing with individualized instructional techniques for students with diverse backgrounds.

ROBERT E. EHLERS, Consultant
Continuation Education
Department of Education
State of California

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
PREFACE	ii
INTRODUCTION	iii
CHAPTER I	1
Interaction of Student, Teacher, Curriculum	1
The Student	2
The Teacher	3
The Curriculum	7
Planning the Individualized Curriculum	8
Development of the Format for the Instructional Package	10
Packaging the Curriculum	14
CHAPTER II	17
Writing an Instructional Package	
What You Are to Learn (Concept	
Why You Need to Learn This (Rationale)	
What You Already Know (Pre-Test)	
What You Will Do to Show You Have Learned (Learning Objectives)	
What You Can Do to Learn (Learning Activities)	
What You Can Use to Learn (Resources)	
How You Will Know You Are Learning (Self-Tests)	
Show What You Have Learned (Post-Test)	
So You Want to Know More (In-Depth Study)	
SAMPLE PACKAGE	
Teachers Section	33
Students Section	37
SUMMARY	47
APPENDIX	48
BIBLIOGRAPHY	50

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Additional appreciation to our two guest speakers, Dr. Richard Jones, Professor, Stanislaus State College; Roy F. Osborne, Minister and Delinquency Counselor; and to Bob Ehlers, State Consultant in Continuation Education, and Elmer Crammer, Principal of DeWolfe High School, Fresno.

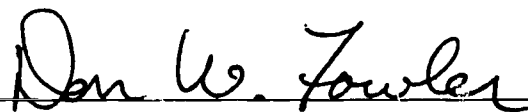
DON W. FOWLER
Workshop Director

PREFACE

This handbook is a beginning; a small step toward understanding the importance of and techniques for developing individualized instruction for those students who have "turned off" or "tuned out" formal education. A major purpose of education is to draw out of a person what is there, even though it is not visible to the individual, to awaken sleeping interests and to reveal to him talents he did not know he possessed.

This handbook will serve as a motivating device, stimulating curriculum creativity in those who believe that teaching the individual is more important than teaching pre-determined and highly structured subject content. The teachers who participated in the workshop, that led to the development of this handbook, believe that to learn is to change and education is a process that changes the learner. Learning involves interaction between the learner and his total environment, and its effectiveness relates to the frequency, variety, and intensity of the interaction.

It was these progressive and aggressive attitudes that contributed to the stimulating and very valuable dialogue that made the workshop and hopefully the handbook a success.

A handwritten signature in dark ink, reading "Dan W. Fowler", is written over a horizontal line.

Project Director

introduction

INTRODUCTION

An alternative educational process is essential to solve the educational problems of the potential high school dropout. California State Law requires that an alternate program, the Continuation Education Program, be provided for divergent youth. This program seeks to develop fundamental knowledge and improve social and intellectual habits by individualizing instruction and learning.

We do not profess to have a magic formula to provide success for every learner, but we feel a significant impact can be made on the educational progress of divergent youth by approaching them individually, and by devising strategies to help them learn more effectively.

The Continuation Education Program is planned to be "different" from the comprehensive high school. The difference lies not in what is taught, but in how it is taught. A student who is capable of completing school, but who does not succeed in the comprehensive high school program, can learn the concepts prescribed by the state, district, and/or local course of study if the individualized learning approach is used.

The use of the individualized instructional package provides a more effective means of reaching the goal of "accepting the student where he is and helping him develop into a contributing citizen within the limits of his ability and personality."

Initially, this report was prepared to aid continuation educators in replacing the contract system currently in use. The description of the changing role of the student, the teacher, and the curriculum, along with specific directions for writing the instructional package will help any teacher to assist his student in:

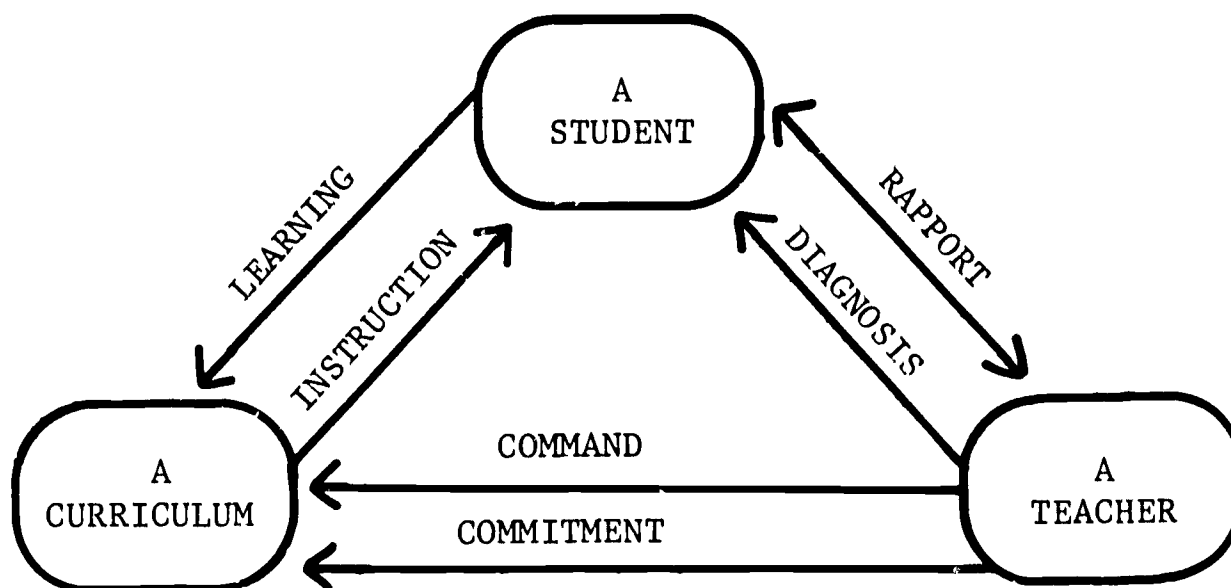
1. Accepting the role of the learner.
2. Assuming the responsibility for his learning.
3. Making what he learns, how he learns, and the need for learning a permanent part of his life.

chapter I

CHAPTER I

THE STUDENT, THE TEACHER, AND THE CURRICULUM

The instructional program of the Continuation Education Program recognizes the necessity for reciprocal interaction between the student, the teacher, and the curriculum. The "Model of Teaching" as diagrammed by Robert H. Anderson, illustrates this type of interaction:



THE STUDENT

Four major groups of students benefit from a Continuation Program:

1. Behavioral: Students who act out their emotions in socially inappropriate negative ways and who may be called "delinquent" or "adjustment" problems.
2. Academic: Students who are unable to achieve success in a school program due to withdrawal, apathy, lack of confidence, expectation of failure and/or little motivation to succeed.
3. Economic: Students who are under 18 years of age who wish to attend or continue school, but must work full or part-time.
4. Physical: Students who cannot attend full time because of poor health, pregnancy, or drug abuse.

The minimum attendance requirement and flexibility of program scheduling in the Continuation Education Program makes education and completion of requirements for a high school diploma more feasible for such students.

The term "divergent" youth is used to describe students who do not fit the norms of characteristics or behaviors one could list. As individuals, they have many and varied needs, but as a group, they show a pattern of under-achievement with an accompanying attitudinal and educational divergency and alienation from learning.

Because he anticipates rejection and failure in the school environment, the continuation student must have acceptance and recognition as a person of value. Continuation educators strive to adapt the program to the needs of the student to a greater degree than is possible in the comprehensive high school. The students' needs can be met by providing an individualized learning approach, a purposeful, relevant course of study and the opportunity for positive relationships with adults and peers. Alienated students may experience educational success for the first time in this learning environment.

THE ROLE OF THE STUDENT

In the traditional, teacher-directed, content-oriented curriculum, the student must master prescribed facts, knowledge, and information. The student has little choice or decision about what and how he will learn, and when and how he will be evaluated. Recent trends in educational methods favor the adoption of the process-oriented curriculum which places the emphasis on learning how to learn.

The individualized program of the Continuation Education Program provides the student with other choices than merely accepting or rejecting the ideas to be learned. He may choose: the way he learns (his mode or style of learning), the time he takes to learn (his rate or speed of learning), and the level at which he learns (the degree of competency by which he is challenged and is successful). In such a program, comparison with the other learners is eliminated, and student frustrations are decreased.

THE TEACHER

Continuation teachers must be sincere in their desire to help students acquire knowledge and develop a more positive self-image. In a classroom with as few as five, or as many as thirty students needing a variety of instructional materials and approaches, the teacher must be capable and versatile in a wide range of subject matter and ability levels. He must organize and manage the program content so that time is available to establish and maintain communication with every student.

Knowledgeable in the dynamics of human relationships as well as subject matter, the most effective teacher has a wide range of interests and experiences. He must reconcile his adult world with the contemporary world of his students. The language, fads, music and fashions of the adolescent, the various ethnic cultures and the environment of the student must be understood. Two other qualities are desirable; those of showmanship, (the ability to make a learning experience more vivid), and salesmanship, (the capability to persuade the reluctant learner that education is essential). Students with problems of aggression, anxiety, negative attitudes and discouragement are encountered daily, and require the stability of an adult personality. The capacity to be unthreatened by the many varieties of adolescent and divergent behaviors must be learned by trial and error, for no textbook offers solutions for crises.

The continuation teacher should be flexible, creative, imaginative, and continually seeking new ways to present

subject matter. Willing to accept the fact that there are more important things in the student's world than the concepts designated for him to learn, the teacher's first concern is the ego development and emotional well-being of the student. The teacher must have the skill to adapt the curriculum when necessary, even leaving the prescribed learnings to use an educational approach which meets the needs of the student.

THE ROLE OF THE TEACHER

The role of the teacher has expanded from "dispenser of knowledge" to "facilitator of learning." This new role includes the management and supportive functions necessary for effective instruction and learning.

In the managerial role, the teacher diagnoses each student's needs, plans activities that appear to be suitable, implements these plans and adapts them as necessary to capitalize on the strengths of each student. The managerial responsibility manifests itself in the following ways:

1. Diagnosis and Assessment:

When the student enters the class, the teacher determines his level of competency for that subject area. By using commercial or teacher-made diagnostic tools, evaluation of his level of achievement for the course can be ascertained. Reading level checks can be made by using the material from the mid-section of a textbook.* It is also important to diagnose writing, speaking, and arithmetic abilities. Remediation must be planned for those areas in which deficiencies are found. The learning activities for each concept to be presented are adjusted to the skill level of the student.

*READING LEVELS

Independent Reading Level

A pupil makes no more than one error in a 100 word passage and understands 9 out of 10 questions.

Instructional Reading Level

A pupil makes no more than 5 errors in a 100 word passage and understands at least 7 of 10 questions.

Frustration Reading Level

A pupil makes more than 5 errors in a 100 word passage and understands less than 7 of 10 questions.

The student's mode or style of learning must be determined so that student options for activities will include those by which he best learns. The teacher plans a variety of possible activities that include visual experiences, auditory experiences, and kinesthetic (tactile) experiences for each concept to be learned. The type of activity the student chooses most often is an indication of his style of learning. Another method is to give the student a "shopping list" test to determine his style, (or combination of modes) of learning.

The Shopping List Game:

- A. Visual: The student writes a shopping list of five items from memory after observing the list.
- B. Auditory: The student writes a list of five items from memory after hearing it dictated to him twice.
- C. Kinesthetic: The student writes a list as it is pronounced to him, then he turns the paper over and writes the list from memory.

Some idea of the interests of the student will help the teacher and student to plan activities that are meaningful and relevant for him. There are many questionnaires and formal tests to determine student interest; however, the most effective way is by informal means; the kinds of books the student chooses, the things he enjoys talking about, or interests elicited at the student and teacher conferences. The conference has the added advantage of the opportunity to establish and maintain rapport with the student.

2. Motivation:

The well-designed program, the activities planned to interest the student, and instruction adapted for the needs of the student, are not always sufficient motivation. There must be a reason for wanting to learn. The best way to motivate the student is to involve him in the planning of learning objectives for his specific needs. With teacher guidance in one-to-one conferences,

the goal of student responsibility for his own learning can be achieved. Helping him plan for himself may require the teacher's writing an instructional package during the conference or rewriting the learning objectives in a previously prepared package.

3. Providing a Variety of Materials and Media:

The teacher must have knowledge of and access to all the available materials and media for the concepts which he has planned for the course of study. Organized storage for filing instructional packages, materials and equipment, along with making the classroom an attractive learning environment, are essential. Knowing how to operate the equipment, training the students in their use and care, and providing easily accessible materials, gives additional time for student-teacher conferences.

4. Providing a Flexible Curriculum:

The ungraded concept of the subject area content requires planning for different levels of achievement and aptitude. The rate of learning will be diversified. Materials and media must be ready for the student as he completes each concept, as well as new sequences of learning for the student who is ready to begin the next semester's work.

Of the students entering the Continuation High School, some will have completed only a few concepts while others will have almost complete mastery of the required learnings. The teacher must help each make a plan to complete the required work from whatever point he may be at. The student begins the next required learning when he demonstrates competency by completing the instructional package or by passing the pre-test.

Complete and accurate records of the concepts the student has mastered must be kept. The completion of curriculum segments can be used as the basis for grades and credit. This self-paced flexible curriculum plan helps the teacher to avoid unfavorable comparisons among the students.

5. Finding Innovative and Creative Instructional Methods:

For students who have not succeeded with the usual presentation of skills and ideas, the teacher must seek new ways to interest and motivate. For example,

learning to read by teaching an elementary school child to read, acquiring skills while on the job in a work experience program, or using the actual income tax forms or application forms for immediate use are some of the ways continuation students have learned basic concepts. Experimental programs, validated by the criteria of educational and attitudinal gains, can make learning more meaningful for continuation students.

In the supportive role, the teacher performs guidance and counseling functions by developing and maintaining effective inter-personal relations with each student. This role is illustrated by teachers who are successful in establishing new lines of communication with disenchanted youth. Respecting the dignity and privacy of the individual, the supportive teacher helps students find and develop new values for themselves. Positive interactions promote a better self-image and help to establish trust and value in school, teachers, and education. By listening and observing carefully, the teacher can become sensitive to students' problems, both personal and educational.

THE CURRICULUM

The curriculum of the Continuation High School is the bridge between what the student is today, and the adult he will be tomorrow. Planning a curriculum requires decisions on the part of the staff as a whole and the teacher as an individual. The autonomy of the philosophy of the school, the staff as a group, and the teacher as an individual is concomitant to the individualized instruction and learning ideals of the continuation program. Curriculum planning guidelines are:

1. The content of each subject area should be essential to the student now and in his future life.
2. Student involvement and interest in learning must be developed and encouraged.
3. The content should be chosen because of its relevancy to the background, interest, and motivation of each student.
4. The structure of the curriculum should be flexible so that a student may enter and begin meaningful work at any time in the school year.
5. The student should not be subjected to unfavorable comparisons with other students while performing tasks designed for his use.
6. All activities should, in some way, broaden the student's interest and perception of his environment and increase his feelings of self-worth and self-esteem.

PLANNING THE INDIVIDUALIZED CURRICULUM

The underlying function of the individualized curriculum is to help the student build a more positive self-image through successful experiences and view the school as a non-threatening environment. By relating the curriculum to what is important in the student's world and encouraging mastery of the basic learnings in each subject area, the continuation student is able to see that achievement is possible and is therefore motivated to learn.

The individualized curriculum places responsibility for his education upon the student. With the guidance of the teacher, the student develops an understanding of his own needs, and educational goals then become both relevant and reachable. Each student works at tasks designed for his needs. He may work independently or with a group of students on a similar task.

The following steps outline the process for the development and use of curriculum for any subject area:

Step 1: Determine Essential Concepts:

WHAT is important for the student to learn, and WHY it is important, must be determined by the teacher at this step.

Step 2: Write the Learning Objectives:

The teacher must decide the valid results of what the learning will be, and what observable behaviors will show that the concept has been mastered.

Step 3: Determine the Acceptable Level of Performance:

The acceptable level of performance for each student must be based on the diagnosis or assessment of the student's achievement or aptitude for the concept.

Step 4: Devise Diagnostic Measures:

Two types of evaluative devices must be developed: 1. The initial or diagnostic test (pre-test); 2. The final evaluation (post-test).

Step 5: Diagnose Student Needs

The pre-test is used to determine the student's present level of knowledge and skills related to the concept.

Step 6: Prescribe Learning Tasks:

The student's performance on the pre-test will determine how the learning activities can be structured for mastery of the concept. If the student displays mastery of the concept, the associated learning activities can be omitted.

Step 7: Implement Learning Tasks:

The student uses the instructional materials and learns through the prescribed learning activities.

Step 8: Evaluate Student Achievement:

The student's mastery of the concept as a result of the learning activities must be assessed in terms of the learning objectives (Step 2). Based on the results of the post-test, the student and teacher decide what learning task is to follow. If mastery is not shown, recycling through alternate learning activities is planned to increase and reinforce the student's learning.

This process may be used for planning a curriculum, a unit of study, or an individualized instructional package.

DEVELOPMENT OF THE FORMAT FOR THE INSTRUCTIONAL PACKAGE

The heart of the continuation education program has been the "contract," a written agreement between the student and the teacher for the amount of work to be completed for credit toward graduation. Recently, the contract system has been further developed and the resulting format is called the instructional package. In this format, the teacher-directed learning has been replaced by the teacher-guided, student-directed learning of basic concepts.

There are several formats currently in use for packaging individualized instruction; namely, I.D.E.A., Kettering Foundation (UNIPAC), Duluth Plan (Contract Units), Learning Activity Package (LAP), Individualized Programmed Instruction (IPI), Teacher-Learning Units (TLU), etc. The instructional package as planned and used by continuation educators is designed for the student in its wording and has the following basic ingredients:

1. What you are to learn: the concept, idea, skill, process or attitude to be learned; stated in a short sentence.
2. Why you need to learn this: the rationale, relevancy, use of this information and its importance to the learner.
3. What you already know: the diagnosis or pre-test.
4. What you will do to show you have learned: the learning objective(s) written in behavioral terms.
5. What you can do in order to learn: learning activities using diversified media and methodology.
6. What you can use to learn: diversified materials and media.
7. How you will know you are learning: self-evaluations for each lesson.
8. Show what you have learned: final evaluation based on the learning objectives.
9. So you want to know more: enrichment.

The directions/instructions, answers to pre- and post-tests, and other materials needed by the teacher should be included in the package and should be removed by the teacher prior to the student's use.

In short, a well-prepared instructional package should answer for the student the three questions asked by Robert F. Mager in the introduction to his book: Developing Attitude Toward Learning.¹

"Where am I going?"	(the concept)
"How shall I get there?"	(the learning activities)
"And, how shall I know I have arrived?"	(evaluation based on the learning objectives)

-
1. Mager, Robert F., Developing Attitude Toward Learning, Fearon Publishers, Palo Alto, California, 1968.

PACKAGING THE CURRICULUM

PACKAGING THE CURRICULUM

The number of concepts to be learned in a content area, particularly if each package is planned to be a short lesson designed for the use of one student for a period of one to five days, amounts to a series or sequence of 15 to 75 instructional packages. For the teacher having little time for preparation, teaching several content areas and/or instructing in a self-contained classroom, this task assumes gigantic proportions.

The plan presented in this report does require time to develop in its entirety. However, many continuation teachers are already adapting curriculum to their own methods, materials and content areas. This format is suggested to simplify and organize materials and media, to involve the students, and to plan for individual needs. The time spent is well worth the effort, not only to organize the classroom, but also to make the teacher available to help individual students.

How does the teacher begin if he wants to adopt the individualized instructional package curriculum? The following suggestions can help:

1. READ

Begin with the references given and read all available materials on the subject. Read the course outlines and study guides as well as other instructional packages. When you arrive at some idea of curriculum in relation to what others have to say, adapt it to your particular situation.

2. ASSESS

Assess yourself and your staff. What are the teaching strengths and weaknesses? Assess the students--reading levels, interests, backgrounds and styles of learning--by using a variety of diagnostic tools. Assess the resources in your school and community. What learning aids are available?

3. EVALUATE

Materials, media and instructional devices must be evaluated in terms of their use and effectiveness. Ask for help from other sources and visit other programs. Experiment until your evaluations prove successful, then continue seeking new materials. Let the students help evaluate textbooks, films and resource materials.

4. COORDINATE

When you have the materials you need, divide the main learnings into small, short units. Get rid of the non-essential work by deciding what concepts your students need and in which course they will be offered.

5. WRITE

Begin to write the course outlines, rationales, learning objectives and tests. In determining the learning objectives, what levels of performance are expected? Diagnostic measures must be devised--standard tests or teacher-made.

6. INDIVIDUALIZE

Find as many methods of learning the concepts as possible. A choice of reading, seeing, hearing, observing or discussing gives the student an opportunity to learn in his own way. This step is a continuing process as new ways to help the student learn are constantly sought.

The most important factors in developing the self-paced instructional packaged-curriculum are: teacher commitment to the philosophy of individualizing instruction and learning, and teacher involvement in designing courses of study and writing instructional packages. As this curriculum is not developed in a short time, some schools have set a goal for each teacher to complete one package a week, some prepare one ingredient at a time for all proposed packages and check the completion on a chart which depicts the segments of the course outline, while others have involved the students in writing packages. The last has proven to be a valuable instructional technique because students learn more as they develop concepts, rationales, objectives and tests intended for other learners, and evaluate instructional materials and resources.

chapter II

CHAPTER II

WRITING AN INSTRUCTIONAL PACKAGE

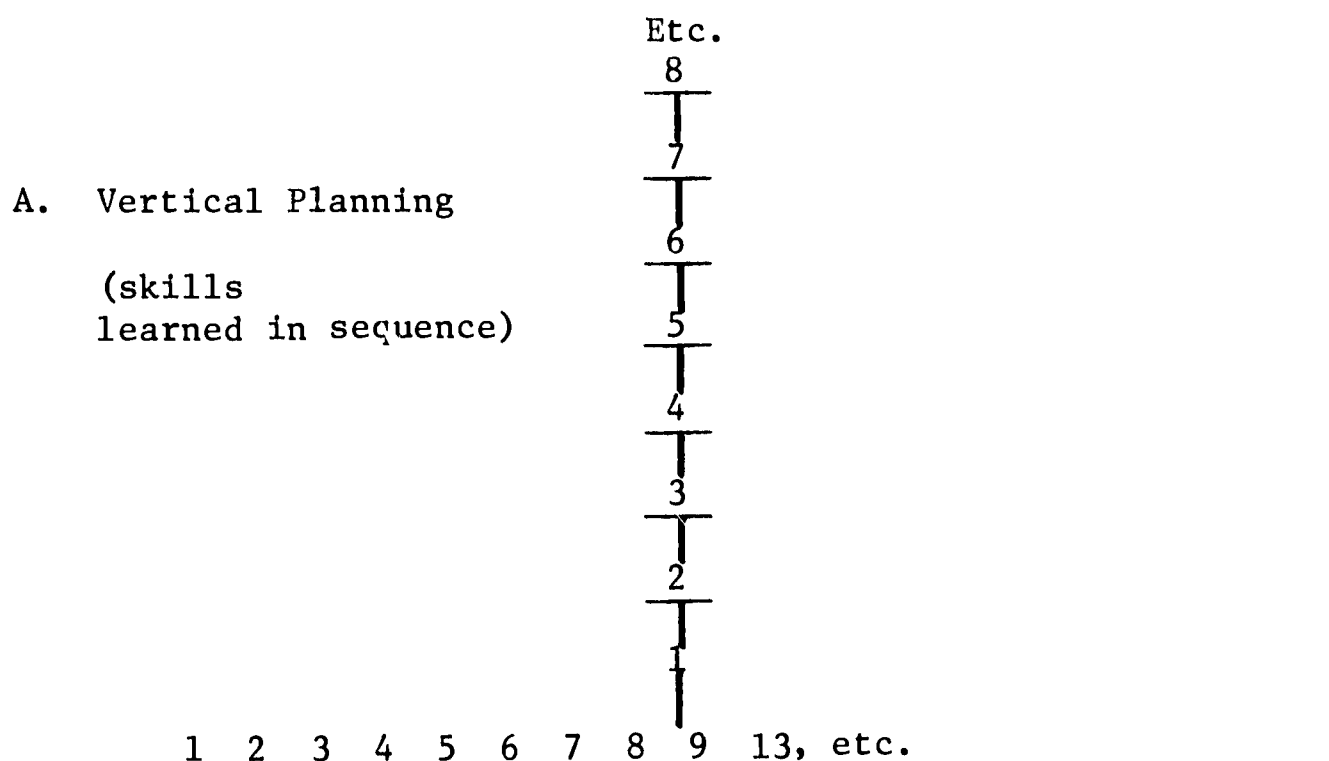
By using the following detailed discussion and examples of the basic ingredients, the teacher can now start to develop instructional packages for use in the classroom.

Although the examples of the basic ingredients are in the area of mathematics, the techniques used to develop them are applicable in every field of study. The examples presented here will be assembled into a completed instructional package at the end of this discussion.

WHAT YOU ARE TO LEARN

This should consist of a brief, complete sentence stating what idea, attitude, process or skill the student is to learn. This can generally be obtained directly from the course of study. It may be necessary to break the major concept into smaller concepts for packaging. Each of the smaller concepts can become the basis of a lesson within the package.

It is here that sequence should also be considered. In the area of mathematics, for instance, it would be necessary for some of the basic skills to be acquired before the student proceeds to the more complex concepts. Those packages which should be completed prior to or subsequent to the current package can be indicated by sequential number or lettering. Other subjects, such as social studies, could be planned for the student to select the curriculum component by his interest or need.



B. Horizontal Planning (concepts chosen in any order)

Any learnable idea, skill, attitude or process that can be stated, can become the basis for an instructional package. At this point, it is necessary to remember that the teaching of isolated facts is not sufficient and that each concept should be related to the broader fundamental structure of the area of knowledge. An example of this part of the package which is based on the use of the slide rule could be:

WHAT YOU ARE TO LEARN

The slide rule can be used as a convenient device for making calculations.

1. The slide rule consists of three (3) main parts; the fixed rule, the slide and the indicator, and five (5) scales, A, D, and K on the fixed rule and B and C on the slide.
2. The slide rule can be used to multiply.
3. The slide rule can be used to divide.
4. Squares and square roots can be found on the slide rule.
5. Cubes and cube roots can be found on the slide rule.

This statement of a learnable idea and its five component ideas becomes the basis of a package containing five lessons which introduce the student to the use of a slide rule.

WHY YOU NEED TO LEARN THIS

Relevancy is the cry today from students in all segments of education, and it is particularly essential for continuation students. The concepts which these students are asked to learn must be current and related to their "way of life." It is important that they perceive this information to be of some use to them as individuals. Seldom will continuation students be interested in "learning for the sake of learning." They must be given a very good reason for learning each concept and, when possible, an application to their everyday life. It may seem a bit unusual for this seemingly non-academic type student to be inspired to want to learn the slide rule; however, if it is presented in the following manner, it may seem more attractive. An example of this part of the package could be the following:

WHY YOU NEED TO LEARN THIS

It is very seldom that an individual carries with him a printed table which contains all the multiplication facts, although every day in some way most individuals use multiplication to solve a problem. It is possible for everyone to carry a small pocket slide rule (perhaps a self-made one) which makes multiplication a very simple computation. The slide rule may be used to solve other types of mathematical problems.

WHAT YOU ALREADY KNOW

Many students react negatively to doing assignments in areas in which they are knowledgeable or which are too difficult. Before starting the learning activities, the student should have the opportunity to demonstrate competencies in the subject area.

The pre-test allows the student and teacher to determine which learning activities may be exempted and which are suitable for individual student use.

The student should be given an explanation of the purpose of the pre-test such as: (The pre-test is designed to determine if you have enough knowledge and skill for using the slide rule to allow you to skip this package and proceed to another one.)

It is necessary that the pre-test evaluate the requirements set forth in the learning objectives. For this package, the pre-test might consist of a demonstration by the student of the use of the slide rule stated as follows:

WHAT YOU ALREADY KNOW

Using a slide rule from which the scale markings have been removed, demonstrate your knowledge and skill to the teacher by doing the following:

1. Identify by name and location the three main parts of the slide rule.
2. Label the A, B, C, D, and K scales on the slide rule.
3. Demonstrate and explain the manipulations of the slide rule which are used in multiplication and division.

WHAT YOU ALREADY KNOW (Continued)

4. Demonstrate the use of the slide rule for finding squares and square roots by finding the square of 27 and the square root of 324.
5. Demonstrate the use of the slide rule for finding cubes and cube roots by finding the cube of 19 and the cube root of 5,832.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Perhaps the most difficult part of the package for the teacher to prepare is the learning objective(s). Telling the student exactly what will be expected of him when it comes time for the final test has not been a part of teacher practices. This, however, is a most essential element of the learning package.

Robert F. Mager's Preparing Instructional Objectives is required reading for all teachers preparing packages.²

A well-written instructional objective should say three things:

1. Performance - what it is that the student who has mastered the objective will be able to do.
2. Conditions - under what set of circumstances the student will do this.
3. Extent - the acceptable level of performance expected of the student.

2. Mager, Robert F., Preparing Instructional Objectives, Fearon Publishers, Palo Alto, California, 1962.

Performance terms which are frequently used include the following:

IDENTIFY:	Select, by pointing to, touching, picking up or naming, the correct object.
DISTINGUISH:	Identify objects or events which are potentially confusable (square, rectangle) or when two contrasting identifications (right, left) are involved.
CONSTRUCT:	Make a structure or drawing which identifies a designated object or set of conditions.
NAME:	Supply the correct name (orally or in written form) for a class of objects, events, etc.
ORDER:	Arrange two or more objects or events in proper order in accordance with a stated category.
DESCRIBE:	Name all the necessary categories relevant to the description of a designated situation.
STATE A RULE:	Make a statement which conveys a rule or principle.
APPLY A RULE:	Use a learned principle or rule to derive an answer to a question.
DEMONSTRATE:	Perform the operations necessary to the application of a rule or principle.
INTERPRET:	Identify objects and/or events in terms of their consequence.
SELECT:	Make a choice from two or more objects.

Examples of expressions used to state Conditions would include:

Given a list of.....
Given a problem of the following class.....
Given a standard set of tools.....
Given a proper functioning.....
Given any reference of the learner's choice.....
Without the aid of references.....
Without the aid of a slide rule.....
Without the aid of tools.....

The Extent, or Level of Performance may be expressed in a number of ways. The following are examples of ways to describe Extent:

State the Time Limit.

Example: ".....run the 100-yard dash within a period of 14 seconds."

Specify the Minimum Number of Correct Responses Acceptable.

Example: ".....spell correctly 80% of words...."

Define the Important Characteristics of Performance Accuracy.

Example: ".....and to be considered correct, problem solutions must be accurate to the nearest whole number."

Philip Kapfer in his discussion of Mager's approach to developing behavioral objectives points out that because these objectives are so specific, one must be careful to avoid triviality.³ Kapfer suggests that to avoid this danger: (1) the behaviorally stated objectives be related to a more broadly stated non-behavioral goal, and (2) the student be given a rationale for asking him to achieve the objective.

Kapfer refers to Burns' discussion which advises stating a behavioral objective with an identification of the "type or category of behavior" expected, followed by a behavioral description. The type or category of words include knowledge, understanding, appreciation, or skill.⁴ He gives the following examples for comparison:

Non-Behavioral Objective Indicating a Type or Category of Behavior:

The student is to gain a knowledge of behavioral objectives.

Objective Indicating a Behavioral Description:

Given a behavioral objective, the learner will identify without error each of the three components (the Performance, the Extent, and the Conditions) of such objectives.

3. Kapfer, Philip G., "Behavioral Objectives, Cognitive and Affective Domain," Education Screen and Audiovisual Guide, July, 1968, pages 10-11.

4. Burns, Richard W., "The Theory of Expressing Objectives," Educational Technology, VII, October 30, 1967.

Burns-Type Combination of the Above:

The learner is to develop a knowledge of behavioral objectives so that when he is given a behavioral objective he can identify, without error, each of the three components (the Performance, the Extent, and the Conditions) of such objectives.

Higher Level Behavioral Objective:

The learner is to develop an understanding of behavioral objectives so that, when given a statement of a learnable idea in his own field, he can write a behavioral objective. Each of the three components of a behavioral objective must be included.

Kapfer further states that Cranfield has added another useful dimension to behavioral objectives - the rationale - which greatly enhances the effective utilization of behavioral objectives.⁵ An example of the use of the rationale is as follows:

Goal:

You are to develop an understanding of behavioral objectives.

Rationale:

Behavioral objectives are important to you and your students because they tell how your students are expected to demonstrate their achievement. In addition, behavioral objectives are the key elements in permitting your students to learn at their own best rates and styles, and in their own unique sequences.

Behavioral Objective:

When you are evaluated for your understanding of behavioral objectives, you will be given a learnable idea in your teaching field. Decide on an observable behavior which will permit the learner to demonstrate his understanding of that learnable idea. Then write a behavioral objective. Be sure that your objective contains all three components of behavioral objectives.

The approach to stating behavioral objectives in the affective domain, as devised by Kapfer, is as follows: (1) state the affective domain as an unobservable behavior (e.g. receiving,

5. Cranfield, Albert A., "A Rationale for Performance Objectives," Audiovisual Instruction, 13, February, 1968.

responding, valuing, organizing, characterizing) and then state the related observable area of behavior, and (2) state finite linear steps in a continuum of behaviors beginning at the "negative" or "neutral" end and progressing to the "positive" end of the continuum. The following example is an affective domain objective:

AFFECTIVE-DOMAIN OBJECTIVE

The student increasingly values independent learning, as observed in his self-initiating and self-directing behaviors.

An example of the continuum of behavior is as follows:

BEHAVIORAL CONTINUUM

1. Given a teacher-assigned delimited topic with assigned specific resources, the student follows directions.
2. Given a teacher-assigned delimited topic and assigned alternative resources, the student selects from the alternative resources.
3. Given a teacher-assigned delimited topic, the student seeks his own resources.
4. Given a teacher-assigned broad topic, the student delimits the topic and seeks his own resources.
5. Given a student-initiated broad topic, the student delimits the topic as necessary, and seeks his own resources.

For this package, the Mager Approach can be used and the objectives stated like this:

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

1. Given a drawing of a slide rule, you will label the three main parts and indicate the location of the A, B, C, D, and K scales.
2. Given five (5) multiplication problems, you will find the products using the slide rule.
3. Given five (5) division problems, you will find the quotients using the slide rule.
4. Given five (5) numerals and a slide rule, you will find the square and the square root of each.
5. Given five (5) numerals and a slide rule, you will find the cube and the cube root of each.

Note that the Extent is omitted from these objectives, giving the teacher the opportunity to vary this according to the students' ability. However, the Extent should be determined by the teacher and/or the student prior to starting the package.

WHAT YOU CAN DO TO LEARN

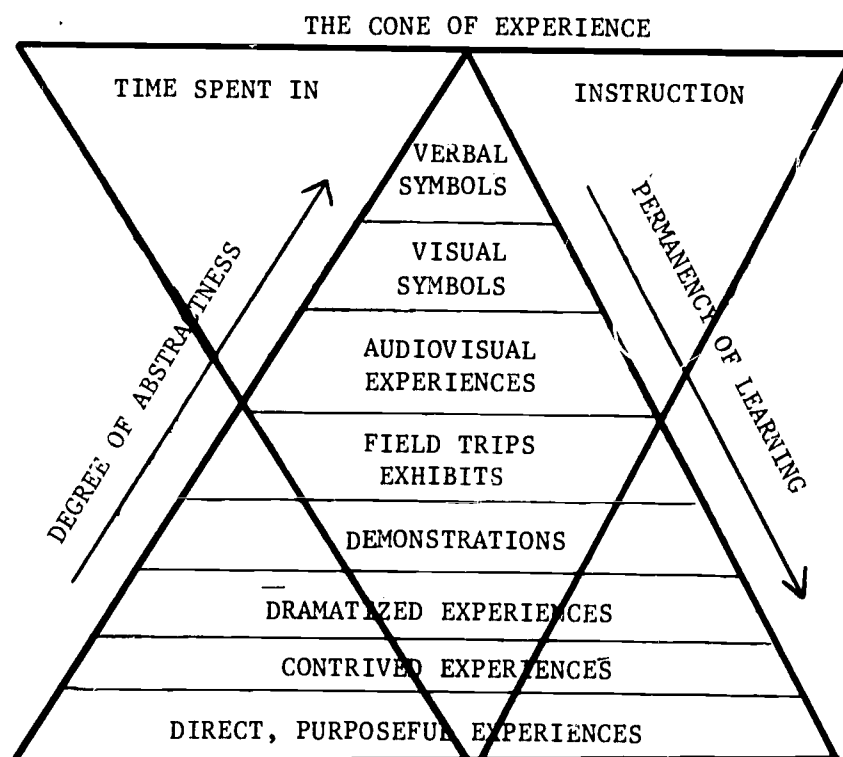
Much of the resistance on the part of teachers toward the preparation of packages stems from the fact that many are trying to write a "new" textbook. The package is not a textbook, but is a guide to the learning materials and media for the students. It is necessary that resources other than the teacher and the textbook be made available to the student. This could include original materials developed by the teacher.

This portion of the package should contain a variety of learning activities from which the student may choose. Henry David Thoreau could well have been talking about continuation students when he wrote:

"If a man does not keep pace with his companions,
Perhaps it is because he hears a different drummer.
Let him step to the music he hears,
However measured or far away."

If the teacher provides enough drummers, the student will surely find one that is his tempo. When the student has found the right activity, it will be compatible with his rate, style and level of learning.

As important as the type of learning activity prescribed for the student, is the amount of time to be spent on that learning activity. The usual time spent type of activity relationship is expressed in graphic form by Dale as follows:⁶



6. Dale, Edgar, AudioVisual Methods in Teaching, The Dryden Press, New York.

The package should allow the student to spend the major portion of learning time on those activities which provide for greater permanency of learning.

The use of the individualized learning package does not preclude the use of standard teaching methodology. The lecture, teacher demonstration, large and small group discussion, while not as simple to use as directed independent study and student-teacher conference in the continuation school, should be utilized if the need and opportunity arise.

For the example of learning activities, only those activities listed for Lesson II of the five lessons in the package will be given. These activities include the following:

WHAT YOU CAN DO TO LEARN

Read

Choose your reading from the following selection:

1. From Part 5 on Page 7 to Part 7 on Page 9 of "Slide Rule Manual."
2. Page 43 to "Division" on Page 47 of "Problem Solving in Chemistry."
3. Pages 91 through 120 of "An Easy Introduction to the Slide Rule."
4. Part 3, Page 4 to Part 6, Page 10 of "Mathematics Enrichment," Book E.
5. Pages 41 through 56 of "Learn Basic Slide Rule on Your Own."

View

Filmstrip: "The Slide Rule, Multiplication C and D Scale."

Exercises

1. Solve Problems 1 through 5, Pages 51-52 of "Problem Solving in Chemistry." or
2. Problem Set XXVI, page 51 of "The Slide Rule."

WHAT YOU CAN USE TO LEARN

Most teachers will have to build their packages around readily available resource materials and media. If sufficient funds are available, there are many aids which are designed, or are adaptable, for use in individualized learning. If you are purchasing new materials, include some of the following: cassette recorders and players, programmed materials, instructional kits, filmstrips and viewers, filmloops and projectors, commercially prepared records and tapes with facilities for using (players and earphones), individual viewer for 16 mm films. Individual use of these aids is more effective if the student has access to a study area such as a carrel.

If a teacher must "make do" with what is available, aids should be selected carefully to support learning in the area prescribed. Just because a book, film, etc., is available does not imply that it must be used. Devices can be designed for the local situation to allow maximum individualized use of materials, media, and facilities. The extent of this "making do" is limited only by the creativity of the teacher.

Of considerable importance is the organization of these resource materials. Not only must they be readily available to the student, but the student must have a clear understanding of how and where to find them and how to use them. Ideas on the organization of facilities and resource materials for individualized learning have been presented by J. Lloyd Trump.⁷

One of the most useful resources, the local community, is probably the most infrequently used. Never hesitate to utilize the local people (government, professional and non-professional) and facilities (museums, factories, newspapers, television and radio stations, etc.) to develop learning situations.

In the package that is being developed, the use of the following resources is indicated:

WHAT YOU CAN USE TO LEARN

Textbooks and programmed texts, 16 mm films, and filmstrips, exercises in problem solving; and, of course, a slide rule and accompanying manual.

-
7. Trump, J. Lloyd, "Independent Study Centers: Their Relation to the Central Library," Bulletin of The National Association of Secondary School Principals, Vol. 50, January 1966, page 46.

HOW YOU WILL KNOW YOU ARE LEARNING

For each lesson, a self-test, check, or evaluation should be provided. This consists of a sample of possible test items and answers. The student is responsible for the evaluation of his own progress and determination of whether to proceed to the next lesson or select another of the suggested learning activities. When the student compares his answer with the correct answer, maximum learning occurs. This is especially true if his answer is incorrect. The follow-up on why it is incorrect is particularly important. This also helps the student to decide when he is ready for the teacher evaluation.

Again, the example for the self-test will be that for Lesson II of the package:

HOW YOU WILL KNOW YOU ARE LEARNING

Find the products for the following multiplication problems using the slide rule:

1. $4 \times .26 =$

2. 7×85

3. $8 \times 1.06 =$

4. $4.2 \times 102 =$

5. $48 \times 12.4 =$

6. $4.80 \times 2.80 \times 31.2 =$

The answers are given following Lesson V.

SHOW WHAT YOU HAVE LEARNED

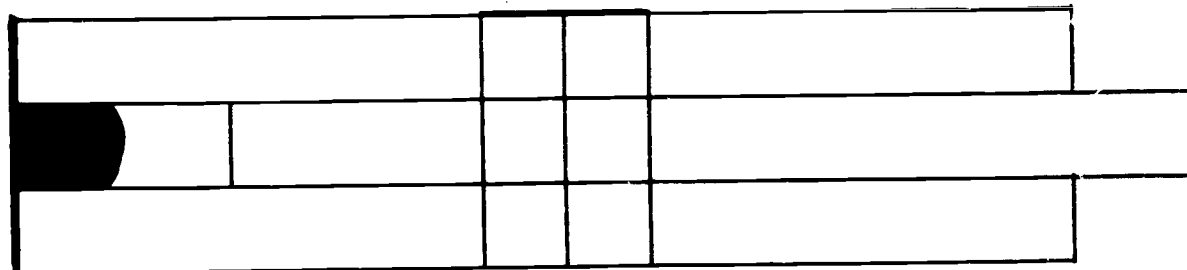
The final evaluation actually serves three purposes. In addition to determining individual student progress, it can be used to evaluate the effectiveness of the instructional program and to provide a basis for suggesting improvements in the program. This can be done only if the final evaluation directly measures the achievement of the learning (behavioral) objectives.

For the package that is being developed, look once again at the learning objectives. Note that the final evaluation is designed to determine precisely which of the learning activities was or was not effective.

SHOW WHAT YOU HAVE LEARNED

Objective: Given a drawing of a slide rule, you will label the three main parts and indicate the location of the A, B, C, D, and K scales.

Test Item: On the drawing below, label the following: fixed rule, slide, indicator, and these scales: A, B, C, D, and K.



Objective: Given five (5) multiplication problems, you will find the products using the slide rule.

Test Item: Using the slide rule find the products for the following multiplication problems.

- A) $.00865 \times 71.5$
- B) 0.14×3.92
- C) $7.5 \times 260 \times 40.8$
- D) $4.80 \times 2.80 \times 31.2$
- E) $12 \times 0.14 \times 9.6 \times 11$

SHOW WHAT YOU HAVE LEARNED (Continued)

Objective: Given five (5) division problems, you will find the quotients using the slide rule.

Test Item: Using the slide rule find the quotients for the following division problems.

- A) $128 \div 3.2$
- B) $76.084 \div 0.0324$
- C) $0.07076 \div 68.40$
- D) $125 \div 5.0$
- E) $1960.2 \div 120.69$

Objective: Given five (5) numerals and a slide rule, you will find the square and square root of each.

Test Item: Using the slide rule give the square and square root for each of the following numerals.

- A) 30 B) 72 C) 294
- D) 698 E) 335

Objective: Given five (5) numerals and a slide rule, you will find the cube and cube root of each.

Test Item: Using the slide rule give the cube and cube root for each of the following numerals.

- A) 216 B) 100 C) 636
- D) 255 E) 965

From this example, the correlation of the test item to the learning objective and then to the learning activities can be seen. Using this procedure the student's achievement and those lessons which were effective or ineffective are easily determined.

SO YOU WANT TO KNOW MORE

Frequently, just as the student is becoming interested in an area of learning, it is dropped completely and some "new" concept is introduced. This is particularly true in the fields of science, social studies and literature. At this point, the opportunity offered to continue with an in-depth study (quest or enrichment activities), application of what has been learned, and the relation of the concept to other areas of study.

Suggestions should be made by the teacher, but there should always be the opportunity and encouragement for students to design their own program. Some suggested activities that could be used to develop skill and knowledge of the slide rule could include the following:

SO YOU WANT TO KNOW MORE

1. Investigate the use of the other scales on the slide rule.
2. Construct a slide rule according to directions given on pages 59-66 of "I Can Learn About Calculators and Computers."
3. Construct a demonstration size slide rule using the directions given in "Teacher-Made Slide Rule." (The Science Teacher, May 1961.)
4. Other activities you or your teacher may suggest.

sample package

THE SLIDE RULE
(This Section for Teacher Use)

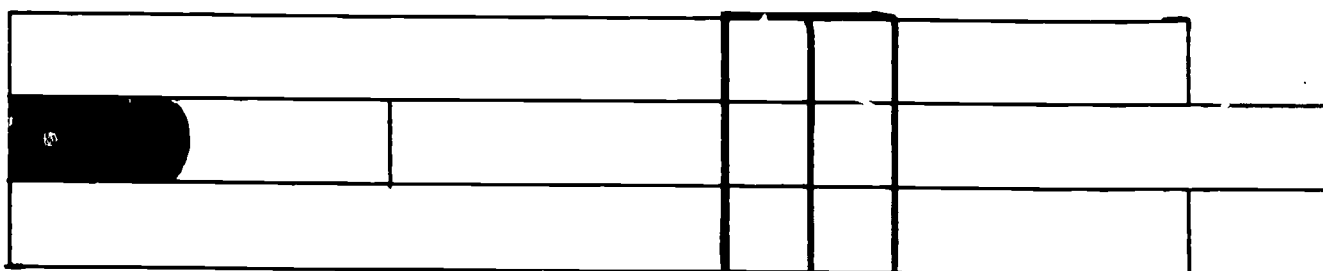
THE SLIDE RULE
(This Section for Teacher Use)

THE SLIDE RULE

SHOW WHAT YOU HAVE LEARNED

1. On the drawing below label the following:

fixed rule, slide, indicator, and these scales,
A, B, C, D, and K.



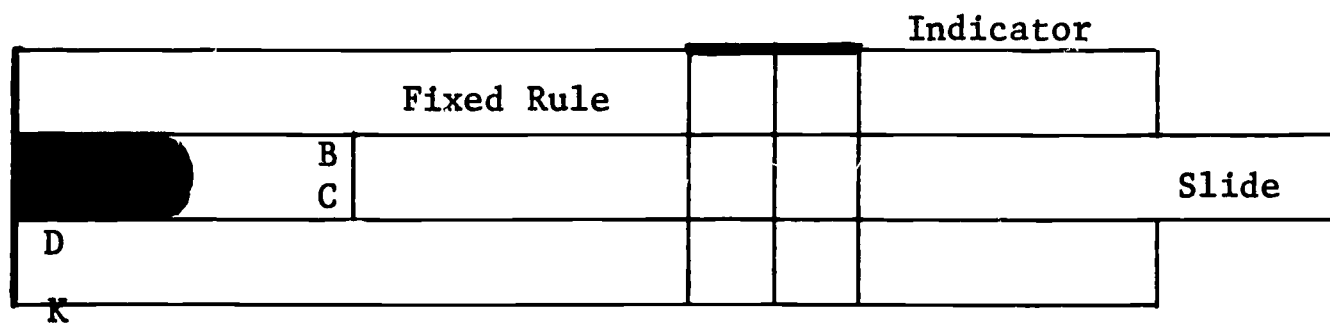
2. Using the slide rule find the products for the following multiplication problems.
- A) $.00865 \times 71.5$ B) 0.14×3.92
- C) $7.5 \times 260 \times 40.8$ D) $4.80 \times 2.80 \times 31.2$
- E) $12 \times 0.14 \times 9.6 \times 11$
3. Using the slide rule find the quotients for the following division problems.
- A) $128 \div 3.2$ B) $76.084 \div 0.0324$
- C) $0.07076 \div 68.40$ D) $125 \div 5.0$
- E) $1960.2 \div 120.69$
4. Using the slide rule give the square and square root for each of the following numerals.
- A) 30 B) 72 C) 294 D) 698
- E) 335
5. Using the slide rule give the cube and cube root for each of the following numerals.
- A) 216 B) 100 C) 636 D) 255
- E) 965

THE SLIDE RULE

SHOW WHAT YOU HAVE LEARNED

KEY

1.



2. A) .618 B) .549 C) 79560
 D) 419.328 E) 177.408
3. A) 40 B) 2348 C) .001
 D) 25 E) 16.2
4. A) 900, 5.477 B) 5041, 8.426
 C) 86436, 17.146 D) 487204, 26.420
 E) 112225, 18.303
5. A) 10077696, 6.0 B) 1000000, 4.641
 C) 257259456, 8.599 D) 16581375, 6.341
 E) 898632125, 9.882

THE SLIDE RULE
(This Section is for Student Use)

WHAT YOU ARE TO LEARN

The slide rule can be used as a convenient device for making calculations.

1. The slide rule consists of three main parts; the fixed rule, the slide and the indicator, and five scales: A, D, and K on the fixed rule, and B and C on the slide.
2. The slide rule can be used to multiply.
3. The slide rule can be used to divide.
4. Squares and square roots can be found on the slide rule.
5. Cubes and cube roots can be found on the slide rule.

WHY YOU NEED TO LEARN THIS

It is very seldom that an individual carries with him a printed table which contains all of the multiplication facts. However, every day in some way most individuals use multiplication to solve a problem. It is possible that everyone could carry a small pocket slide rule (perhaps a self-made one) which makes multiplication a simple computation. The slide rule may be used for other types of mathematical problems.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

1. Given a drawing of a slide rule, you will label the three main parts and indicate the location of the A, B, C, D, and K scales.
2. Given (5) multiplication problems, you will find the products using the slide rule.
3. Given (5) division problems, you will find the quotients using the slide rule.
4. Given (5) numerals and a slide rule, you will find the square and square root of each.
5. Given (5) numerals and a slide rule, you will find the cube and the cube root of each.

WHAT YOU ALREADY KNOW

The pre-test is designed to determine if you have enough knowledge of and skill for using the slide rule to allow you to skip this package and proceed to another one.

Pre-test:

Using a slide rule from which the scale markings have been removed, demonstrate your knowledge and skill to the teacher by doing the following:

1. Identify the name and location of the three main parts of the slide rule.
2. Label the A, B, C, D, and K scales on the slide rule.
3. Demonstrate and explain the manipulations of the slide rule which are used in multiplication and division.
4. Demonstrate the use of the slide rule for finding squares and square roots by finding the square of 27 and the square root of 324.
5. Demonstrate the use of the slide rule for finding cubes and cube roots by finding the cube of 19 and the cube root of 5,832.

THE SLIDE RULE

LESSON I

WHAT YOU NEED TO LEARN

The slide rule consists of three main parts: the fixed rule, the slide and the indicator, and five scales, A, D and K on the fixed rule and B and C on the slide.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Given a drawing of the slide rule, you will label the three main parts and indicate the location of the A, B, C, D and K scales.

WHAT YOU CAN DO AND USE TO LEARN

Read Choose your reading from the following selections:

1. Page 3 to part 5 on page 7 of "Slide Rule Manual."
2. Pages 37 through 42 of "Problem Solving in Chemistry."
3. Pages 1 through 15 of "An Easy Introduction to the Slide Rule."
4. Page 1 to part 3 on page 4 of "Mathematics Enrichment," Book E.
5. Pages 2 through 18 of "Learn Basic Slide Rule on Your Own."

View 16 mm film: "Slide Rule C & D Scale," 24 minutes
B & W.

HOW YOU WILL KNOW YOU ARE LEARNING

1. Name the three main parts of the slide rule.
2. Give the location of the A, B, C, D, and K scales.

The answers are given following Lesson V.

THE SLIDE RULE

LESSON II

WHAT YOU NEED TO LEARN

The slide rule can be used to multiply.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Given five (5) multiplication problems, you will find the products using the slide rule.

WHAT YOU CAN DO AND USE TO LEARN

Read Choose your reading from the following selections:

1. From part 5 on page 7 to part 7 on page 9 of "Slide Rule Manual."
2. Page 43 to Division on page 47 of "Problem Solving in Chemistry."
3. Pages 91 through 120 of "An Easy Introduction to the Slide Rule."
4. Part 3 on page 4 to part 6 on page 10 of "Mathematics Enrichment," Book E.
5. Pages 41 through 56 of "Learn Basic Slide Rule on Your Own."

View Filmstrip: "The Slide Rule, Multiplication C & D Scale."

- Exercises
1. Solve problems 1 through 5, pages 51 and 52 of "Problem Solving in Chemistry." or
 2. Problem Set XXVI, page 51 of "The Slide Rule."

HOW YOU WILL KNOW YOU ARE LEARNING

Find the products for the following multiplication problems using the slide rule:

- | | |
|---------------------|-----------------------------------|
| 1. $4 \times .26$ | 2. 7×85 |
| 3. 8×1.06 | 4. 4.2×102 |
| 5. 48×12.4 | 6. $4.80 \times 2.80 \times 21.2$ |

The answers are given following Lesson V.

THE SLIDE RULE

LESSON III

WHAT YOU NEED TO LEARN

The slide rule can be used to divide.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Given five (5) division problems, you will find the quotients using the slide rule.

WHAT YOU CAN DO AND USE TO LEARN

Read Choose your reading from the following selections:

1. Part 7 on page 9 to part 9 on page 12 of "Slide Rule Manual."
2. Pages 47-51 of "Problem Solving in Chemistry."
3. Pages 91-151 of "An Easy Introduction to the Slide Rule."
4. Part 6 on page 10 through page 17 of "Mathematics Enrichment," Book E.
5. Pages 57-68 of "Learn Basic Slide Rule on Your Own."

View Filmstrip: "The Slide Rule, Division C & D Scale."

- Exercises
1. Problems 6 through 17 on page 52 of "Problem Solving in Chemistry." or
 2. Problem Set XXVII, page 53 of "The Slide Rule."

HOW YOU WILL KNOW YOU ARE LEARNING

Find the quotients for the following division problems using the slide rule:

- | | |
|----------------------------|-------------------------------------|
| 1. $3.42 \div 81.7$ | 2. $132 \div 60$ |
| 3. $6.3 \div 9$ | 4. $14.5 \div 6.6$ |
| 5. $\frac{5 \times 24}{3}$ | 6. $\frac{20 \times 3}{6 \times 5}$ |

The answers are given following Lesson V.

THE SLIDE RULE

LESSON IV

WHAT YOU NEED TO LEARN

Squares and square roots can be found on the slide rule.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Given five (5) numerals and a slide rule, you will find the square and square root of each.

WHAT YOU CAN DO AND USE TO LEARN

Read Choose your reading from the following selections:

1. Part 17 on page 29 through part 19 on page 31 of "Slide Rule Manual."
2. Pages 153-174 and 177-181 of "An Easy Introduction to the Slide Rule."
3. Pages 91-104 of "Learn Basic Slide Rule on Your Own."

View 16 mm film: "Slide Rule," 21 minutes B & W, or
Filmstrip: "Exponents."

HOW YOU WILL KNOW YOU ARE LEARNING

Using a slide rule find the square and square root of each of the following:

Numeral	Square	Square Root
4		
36		
64		
49		
144		
18		

The answers are given following Lesson V.

THE SLIDE RULE

LESSON V

WHAT YOU NEED TO LEARN

Cubes and cube roots can be found on the slide rule.

WHAT YOU WILL DO TO SHOW YOU HAVE LEARNED

Given five (5) numerals and a slide rule, you will find the cube and the cube root of each.

WHAT YOU CAN DO AND USE TO LEARN

Read Choose your reading from the following selections:

1. Part 21 on page 35 through part 23 on page 37 of "Slide Rule Manual."
2. Pages 174-176 and 181-185 of "An Easy Introduction to the Slide Rule."
3. Pages 105-112 of "Learn Basic Slide Rule on Your Own."

HOW YOU WILL KNOW YOU ARE LEARNING

Using a slide rule find the cube and cube root of each of the following:

Numeral	CUBE	CUBE ROOT
64		
27		
125		
9		
729		

The answers are given on the next page.

KEY FOR HOW YOU WILL KNOW YOU ARE LEARNING

LESSON I

1. The three main parts of the slide rule are fixed rule, slide and indicator.
2. The A, D and K scales are located on the fixed rule and the B and C scales on the slide.

LESSON II

- | | | |
|----------|----------|------------|
| 1. 1.04 | 2. 595 | 3. 8.48 |
| 4. 428.4 | 5. 595.2 | 6. 419.328 |

LESSON III

- | | | |
|----------|--------|-------|
| 1. .0419 | 2. 2.2 | 3. .7 |
| 4. 2.2 | 5. 40 | 6. 2 |

LESSON IV

Square

16
1296
4096
2401
20736
324

Square Root

2
6
8
7
12
4.24

LESSON V

Cube

262144
19683
1953125
279
387420489

Cube Root

4
3
5
2.08
9

SO YOU WANT TO KNOW MORE

1. Investigate the use of the other scales on the slide rule.
2. Construct a slide rule according to directions given on pages 59-66 of "I Can Learn About Calculators and Computers."
3. Construct a demonstration size slide rule using the directions given in "Teacher-Made Slide Rule."
(The Science Teacher, May 1961.)
4. Other activities you or your teacher may suggest.

SUGGESTED MATERIALS

16 mm film: "Slide Rule: C & D Scale," 24 min., B & W.

"Slide Rule," 21 min., B & W.

Filmstrips: "The Slide Rule, Multiplication C & D Scale."

"The Slide Rule, Division C & D Scale."

"Exponents."

Books: Asimov, Isaac, "An Easy Introduction to the Slide Rule," Houghton Mifflin Books, Boston.

Kells, Lyman M., Willis F. Kern and James R. Bland, "Slide Rule Manual," Keuffel & Esser Co.

Kenyon, Raymond G., "I Can Learn About Calculators and Computers," Harper and Row.

Mueller, Francis J. and Alice M. Hack, "Mathematics Enrichment Book E," Harcourt, Brace & World, Inc.

Schill, W. J., et al, "Learn Basic Slide Rule on Your Own," Frederick Post Co., Chicago.

Tillbury, Glen, "Problem Solving in Chemistry," Lyons and Carnahan, New York.

Equipment: Slide rule.

16 mm projector for individual use.

Filmstrip projector or viewer.

summary

SUMMARY

The Continuation Education Program strives to develop positive attitudes and usable skills through individualizing instruction and learning for divergent youth. A student who has accepted the responsibility of the learner's role and who perceives the school as a nonthreatening environment might say:

.....Everyday I have something interesting to do, things I like to do and can do.

.....Adults at school like me, know me, and are interested in me.

.....My education depends on my decisions, and I have a choice in what I want to learn and how I want to learn.

.....Each day I have success in learning, or have encouragement that I can learn, or that I am learning how to learn.

.....I share my experiences and understandings with others without feeling inferior.

.....I test my view of the world against others' views without criticism or reprisal.

.....I talk over problems and issues with adults who listen.

.....School is worth the effort because I want to learn.

Such a student is the product of the continuation educator's philosophy and commitment to this alternative educational program. The above statements stem from the observable behavior of a student who has assumed autonomy in his role as a learner and participates in the decision-making process for determining his goals.

A student will want to learn if: he has a choice in what to learn, the understanding of what he needs to learn, a teacher he likes and respects, and a variety of activities, media, materials and methods to use to succeed in learning. The instructional package, as used in the Continuation Education Program, helps the student to know what he is expected to do and how he is to show he has learned. The result is student pride and satisfaction in achieving educational goals.

appendix

FARR-JENKINS-PATERSON SIMPLIFICATION
OF FLESCH READING EASE FORMULA

It is recommended that the Farr-Jenkins-Paterson Formula (F-J-P Method) with the Flesch Chart be used to determine readability of materials that are used as resources for learning activities in the instructional packages.

Farr, Jenkins, and Paterson, three members of the Psychology Department at the University of Minnesota, published a revision of the Flesch Reading Ease Formula in 1951.

Based on strong statistical evidence, they stated that:

"The correlation between the number of one syllable words and the number of syllables-per-100 words was found to be $-.91$."

The ease of reading may be determined. This method does not penalize material that contains technical words. So long as many of the supporting words are monosyllabic and the style tends to use short, terse sentences, the selection may still rate a low reading score.

The authors have replaced Fry's graph and Flesch's formula with a simple table that scores reading ease from zero to one hundred.

The Farr-Jenkins-Paterson formula was applied to a representative selection of materials now in use and found a strong correlation between the Farr-Jenkins-Paterson readability score and the publisher's recommended grade level. Material that scores in the 60-80 range is for intermediate (6-8) grades.

Average Sentence Length

-50-

DF:rk
12-22-69

Evaluator

bibliography

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